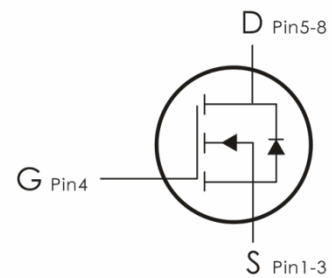
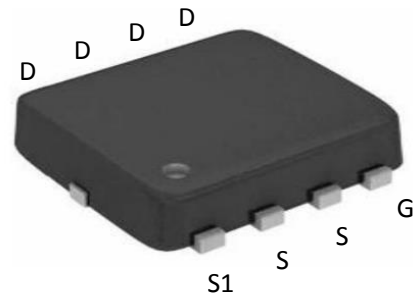


Description:

This N-Channel MOSFET uses advanced trench technology to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features:

- 1) $V_{DS}=30V, I_D=40A, R_{DS(ON)}=10m\Omega @ V_{GS}=10V$
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.



Absolute Maximum Ratings: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current Continuous ($T_C=25^\circ\text{C}$) ¹	40	A
	Continuous Drain Current-($T_C=100^\circ\text{C}$) ¹	24	
I_{DM}	Drain Current – Pulsed ²	75	A
E_{AS}	Single Pulse Avalanche Energy ³	24.2	mJ
I_{AS}	Avalanche Current	22	W
P_D	Power Dissipation ($T_C=25^\circ\text{C}$) ⁴	1.67	W/ $^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	4.8	$^\circ\text{C}/\text{W}$

R_{θJA}	Thermal Resistance, Junction to Ambient ¹	75	°C/W
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Package Marking and Ordering Information:

Part NO.	Marking	Package
ZC010NG	C010N	DFN3*3-8

Electrical Characteristics: (T_C=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =30V, T _J =25°C	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
On Characteristics						
V_{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μA	1	---	2.5	V
R_{DS(on)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =15A	---	8.5	10	mΩ
		V _{GS} =4.5V, I _D =10A	---	11	17	
G_{FS}	Forward Transconductance	V _{DS} =5V, I _D =15A	---	24.4	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V _{DS} =1V, V _{GS} =0V, f=1MHz	---	896	---	pF
C_{oss}	Output Capacitance		---	126	---	
C_{rss}	Reverse Transfer Capacitance		---	108	---	
Switching Characteristics						
t_{d(on)}	Turn-On Delay Time	V _{DD} =15V, V _{GS} =10V, R _G =1.5Ω, I _D =20A	---	6.4	---	ns
t_r	Rise Time		---	39	---	ns
t_{d(off)}	Turn-Off Delay Time		---	21	---	ns
t_f	Fall Time		---	4.7	---	ns
Q_g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _D =12	---	9.82	---	nC
Q_{gs}	Gate-Source Charge		---	2.24	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	5.54	---	nC

Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1	V
I_S	Reverse Recovery Time ^{1,5}	$V_G=V_D=0V, \text{ Force Current}$	---	37	---	nS
I_{SM}	Reverse Recovery Charge ^{2,5}		---	75	---	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22A$
4. The power dissipation is limited by 175°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

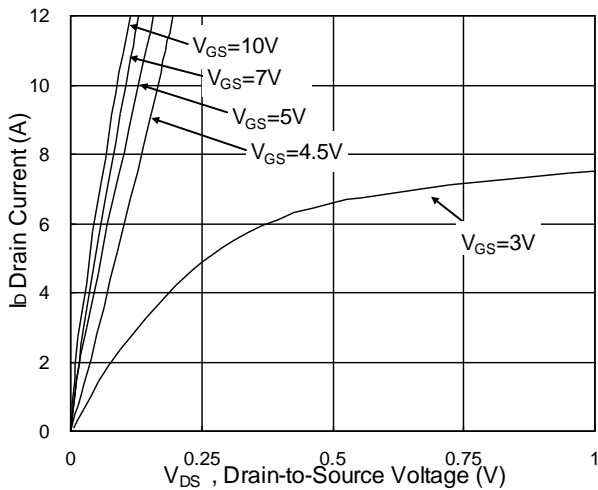


Fig.1 Typical Output Characteristics

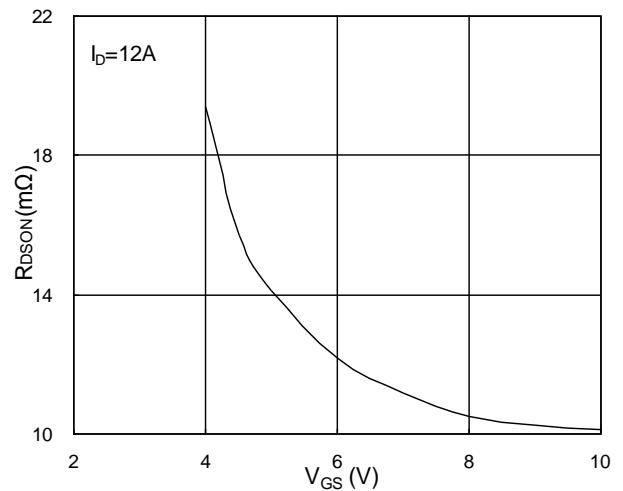


Fig.2 On-Resistance vs. G-S Voltage

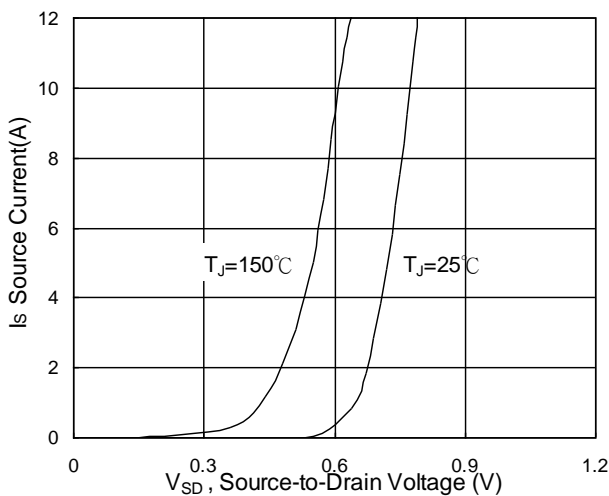


Fig.3 Forward Characteristics of Reverse

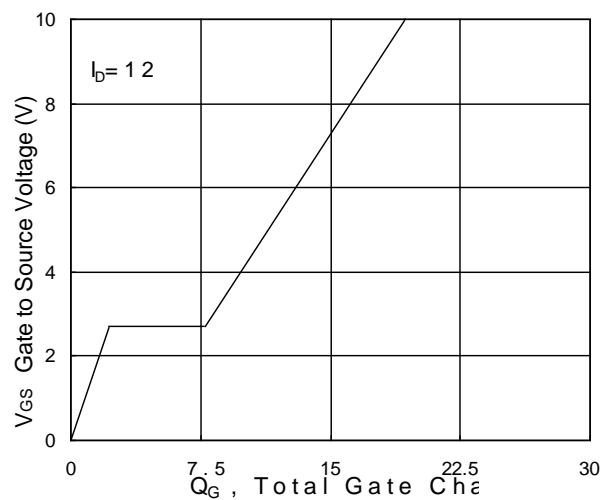


Fig.4 Gate-charge Characteristics

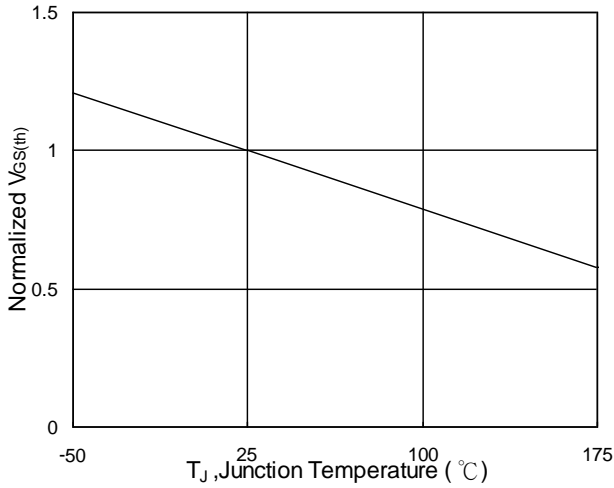


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

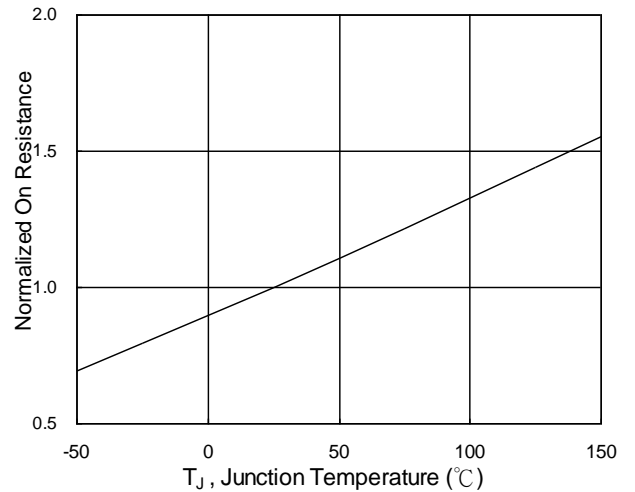


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

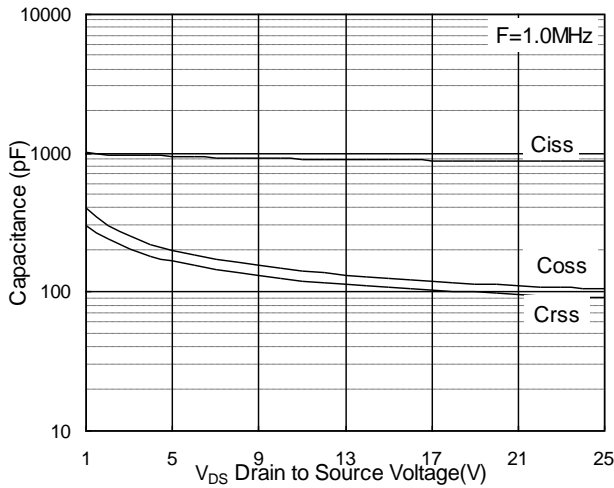


Fig.7 Capacitance

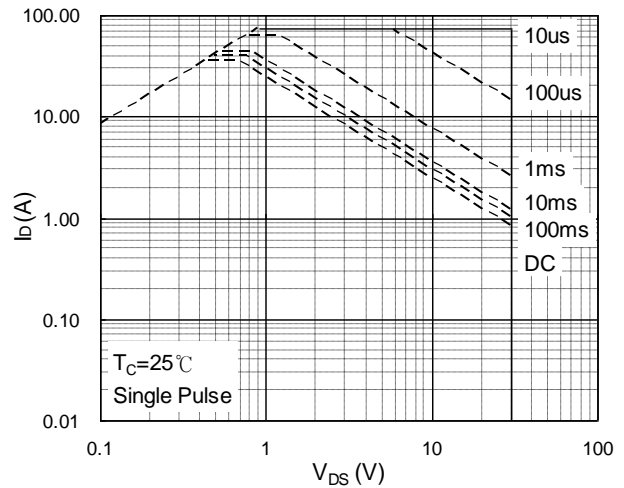


Fig.8 Safe Operating Area

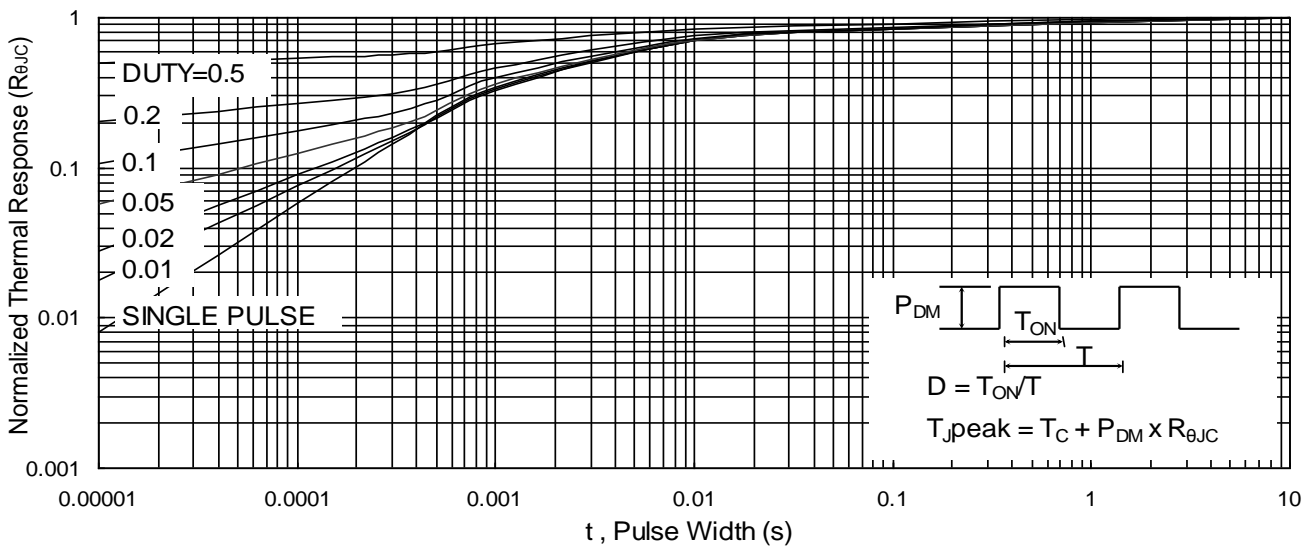


Fig.9 Normalized Maximum Transient Thermal Impedance